

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 16 OCT 2006

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|  |   |   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
|--|---|---|-----------------------|-------------------------------------|-----------|---------------------|--------------------------|------------|----------|--------------------------|-------------|--|-------------------------------------|------------|----------------------------|-------------------------------------|-----------|---|--------------------------|------------|-------------------------|--------------------------|-------------|--|--------------------------|--------------|---|
| Applicant's or agent's file reference<br>5869-039  | FOR FURTHER ACTION  |   | See Form PCT/IPEA/416 |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| International application No.<br>PCT/US04/37409  | International filing date (day/month/year)<br>10 November 2004 (10.11.2004) | Priority date (day/month/year)<br>11 November 2003 (11.11.2003)   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| International Patent Classification (IPC) or national classification and IPC<br>IPC: H04M 1/00(2006.01), 9/00(2006.01), 9/08(2006.01)<br>USPC: 379/406.1   |   |   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Applicant<br>MATECH INC  |   |   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> |   |   |                       | <input checked="" type="checkbox"/> | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input checked="" type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> | Box No. VI | Certain documents cited | <input type="checkbox"/> | Box No. VII | Certain defects in the international application | <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/>  | Box No. I   | Basis of the report   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>   | Box No. II  | Priority  |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>   | Box No. III   | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input checked="" type="checkbox"/>  | Box No. IV  | Lack of unity of invention  |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input checked="" type="checkbox"/>  | Box No. V   | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>   | Box No. VI  | Certain documents cited   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>   | Box No. VII   | Certain defects in the international application  |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| <input type="checkbox"/>   | Box No. VIII  | Certain observations on the international application   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Date of submission of the demand<br>03 May 2005 (03.05.2005)   |   | Date of completion of this report<br>11 May 2006 (11.05.2006)   |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |
| Name and mailing address of the IPEA/US<br>Mail Stop PCT, Attn: IPEA/US<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, Virginia 22313-1450<br>Facsimile No. (571) 273-3201  |   | Authorized officer<br>Curtis A Kuntz<br>Telephone No. 703-305-4708  |                       |                                     |           |                     |                          |            |          |                          |             |  |                                     |            |                            |                                     |           |   |                          |            |                         |                          |             |  |                          |              |   |

Form PCT/IPEA/409 (cover sheet)(April 2005)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/37409

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4(a))
  - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☒ the description:
- pages 1-21 as originally filed/furnished
- pages\* NONE received by this Authority on \_\_\_\_\_
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages 22-32 as originally filed/furnished
- pages\* NONE as amended (together with any statement) under Article 19
- pages\* NONE received by this Authority on \_\_\_\_\_
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1/10-10/10 as originally filed/furnished
- pages\* NONE received by this Authority on \_\_\_\_\_
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/37409

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:
  - ☒ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest, and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☐ neither restricted the claims nor paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
  - ☒ complied with.
  - ☐ not complied with for the following reasons:
4. Consequently, this report has been established in respect of the following parts of the international application:
  - ☐ all parts
  - ☒ the parts relating to claims Nos. 1-27

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US04/37409**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

|                               |                                   |     |
|-------------------------------|-----------------------------------|-----|
| Novelty (N)                   | Claims <u>none</u>                | YES |
|                               | Claims <u>1-3,5-7,11-13,19,22</u> | NO  |
| Inventive Step (IS)           | Claims <u>none</u>                | YES |
|                               | Claims <u>1-27</u>                | NO  |
| Industrial Applicability (IA) | Claims <u>1-27</u>                | YES |
|                               | Claims <u>NONE</u>                | NO  |

**2. Citations and Explanations (Rule 70.7)**

Claims 1-3,5-7,11-13,19,22 lack novelty under PCT Article 33(2) as being anticipated by Hietanen (6415034). Hietanen discloses a two way communication device for use in an ear. The device comprises a dsp that implements an adaptive algorithm to generate filter coefficients that are used to subtract (examiner reads an adder and subtractor as the same device) an echo signal from the transmitted signal (Col 5 lines 25-45, Col 7 lines 5-22). The dsp monitors the transmission and reception through transducers. Since the DSP is digital it inherently operates periodically (as per the clocking rate). The device further comprises a VOX (Fig. 4 items 30,32) to control the gain of the transmitted and received signals. The device further comprises A/D and D/A converters 31,33,35,39. The device further comprises a compensation filter (within DSP 34) used to simulate the echo that is subtracted from the outgoing signal (Fig. 3). The adaptive filter (dsp) is reconfigured (adapted) after a predetermined amount of time (determined by the clocking rate).

Claims 4,8-10,14,20,21,23-27 lack an inventive step under PCT Article 33(3) as being obvious over Hietanen (6415034) in view of Fang et al. (6480610). Hietanen discloses a two way communication device, however, Hietanen does not disclose that the echo cancellation system comprises a test signal being switched on in order to set the parameters of a second filter (in addition to the adaptive echo estimation filter). Fang discloses an improved echo cancellation algorithm in an ear device. The A/D, D/A converters inherently comprises a low pass filter for the purpose of filtering the output digital signal and the system further comprises attenuators 570a,570m to attenuate both the transmitted and received signals based on a power control. The echo cancelling algorithm comprises utilizing a second filter (training filter) in addition to the primary adaptive filter (Col 4 lines 14-47). The training filter is set by using a training signal impulse that is switched in (switches 594a-594m Fig. 5). Both the training and adaptive filters are periodically updated to adapt for changes in the echo paths. It would have been obvious to utilize the improved echo cancellation algorithm of Fang for the purpose of achieving improved echo cancellation in the device of Hietanen.

Claims 15-18 lack an inventive step under PCT Article 33(3) as being obvious over Hietanen (6415034) in view of Fang et al. (6480610) and further in view of Schultz et al. (6357292). Hietanen and Fang disclose a two way communications device with a digital echo canceller that utilizes a switchable test signal, but they do not disclose that a single transducer is used to transmit and receive information. Schultz discloses a duplex transducer (Fig. 21) coupled to resistive bridge 1322 (Col 27 line 55 to Col 28 line 33) with each direction of communication coupled to a differential amplifier 1132,1134. It further would have been obvious to implement capacitors along with the resistors for the purpose of reducing any high frequency noise from the system. Schultz further discloses a variable resistance element used in order to adjust the transducer circuitry (Col 6 lines 30-45). It would have been obvious to implement a single transducer in the device of Hietanen in view of Fang for the purpose of reducing the number of transducers needed for the device to operate (saving cost).

Claims 1-27 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in the communications industry.

----- NEW CITATIONS -----